

WHAT IS CLAIMED IS:

1 1. A sensor useful for assaying a component of a fluid, comprising:
2 a chamber having an inlet, a liquid containing portion and a vapor containing
3 portion, the inlet adapted to admit a liquid sample into the liquid containing portion, the
4 liquid and vapor containing portions being in fluid communication;

5 an enzyme source adapted to provide an enzyme for which the component is a
6 substrate either before the liquid sample is admitted into the liquid containing portion or
7 during residence of the liquid sample therein; and,

8 a pressure monitor in communication with the vapor containing portion and of
9 a construction sufficient to measure pressure change within the vapor containing portion,
10 wherein pressure change within the vapor containing portion is related to concentration of the
11 component of the fluid.

1 2. The sensor as in claim 1 wherein the enzyme hydrolyzes the
2 component.

1 3. The sensor as in claim 2 wherein the liquid containing portion of the
2 chamber is capable of agitation sufficient to increase the rate of volatilization of dissolved gas
3 in the liquid sample.

1 4. The sensor as in claim 1 wherein the pressure monitor is adapted to
2 measure partial pressure of CO₂.

1 5. The sensor as in claim 1 wherein the enzyme source contains
2 immobilized enzyme.

1 6. The sensor as in claim 1 wherein the liquid and vapor containing
2 portions are in fluid communication through a porous membrane.

1 7. The sensor as in claim 2 wherein the enzyme is urease.

1 8. The sensor as in claim 2 wherein the enzyme is uricase or urate
2 oxidase.

1 9. The sensor as in claim 7 wherein the biological fluid is blood, milk or
2 urine and the pressure monitor is calibrated to provide urea or urea nitrogen (UN) content of
3 the biological fluid.

1 10. The sensor as in claim 9 wherein the biological fluid is milk and the
2 prediction error for UN is not greater than about +/- 1 mg/dl in the range of from about 6
3 mg/dl to about 24 mg/dl.

1 11. A method of analyzing a component of an enzymatically catalyzed
2 process from a test sample, comprising:

3 providing a liquid sample of the test sample;

4 contacting the sample either with an enzyme for which the component is a
5 substrate or with a substrate for which the component is an enzyme, wherein the contacting
6 forms carbonate ion in equilibrium with carbon dioxide; and,

7 detecting the carbon dioxide.

1 12. The method as in a claim 11 wherein the biological fluid is blood, urea
2 or milk and the component is urea.

1 13. A method of analyzing milk urea nitrogen (MUN) in dairy milk,
2 comprising:

3 providing a dairy milk sample;

4 contacting the sample with urease, at least one of the dairy milk sample and
5 the urease being in a liquid solution, wherein the contacting forms an equilibrium between
6 carbonate ion and carbon dioxide;

7 shifting the equilibrium towards carbon dioxide; and,

8 detecting carbon dioxide.

1 14. The method as in claim 13 wherein the carbon dioxide is detected as a
2 vapor phase in fluid communication with the liquid solution.

1 15. The method as in claim 13 wherein the carbon dioxide is detected as a
2 partial pressure.

1 16. The method as in claim 13 wherein the equilibrium is shifted by
2 admixing the liquid solution with a pH adjusting agent.

1 17. The method as in claim 13 further comprising correlating the carbon
2 dioxide detected to the concentration of MUN in the dairy milk sample.

1 18. The method as in claim 13 wherein the contacting includes agitating
2 the dairy milk sample.

1 19. The method as in claim 17 wherein the prediction error for MUN in the
2 dairy milk sample is not greater than about +/- 1 mg/dl.

1 20. The method as in claim 13 wherein the urease is immobilized.